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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
ZHEN, LI B	

ART UNIT	PAPER NUMBER
2126	5

DATE MAILED: 06/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/885,632	ELVING, CHRISTOPHER H.	
	Examiner	Art Unit	
	Li B. Zhen	2126	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 August 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1 – 35 are pending in the application.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 2, 8, 14 – 16, 18, 24 and 30 – 35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. The term "likely" in claims 2, 8, 14 – 16, 18, 24 and 30 – 35 is a relative term which renders the claim indefinite. The term "likely" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The limitations "likely to be associated with a data buffer that is available for storing said log data" [claims 2, 15, 18, 31 and 34], "likely available for storing" [claims 8, 16, 24, 32 and 35] and "likely available for buffering data" [claims 14, 30 and 33] is indefinite because a buffer may or may not be available for buffering.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1 – 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent NO. 6,182,086 to Lomet in view of U.S. Patent NO. 6,493,837 to Pang.

7. As to claim 1, Lomet teaches the invention substantially as claimed including a computer-implemented method for buffering data [records are posted in the log buffer 88; col. 10, lines 33 – 57] in a multithreaded environment [application is then re-executed asynchronously to the further redo processing of the log...in a separate process or thread; col. 17, lines 20 – 36], comprising:

generating log data [At step 64, the server logs the reply on the stable log; col. 7, lines 29 – 39] in response to a request for accessing a resource [At step 60, the client sends a request to the server; col. 7, lines 28 – 39];

identifying a buffer management structure [a resource manager 82 that maintains temporary copies of data pages and application states; col. 8, line 65 – col. 9, line 32] that is associated with a plurality of data buffers [resource manager 82 includes a volatile cache 84, a cache manager 86, a volatile log 88, a log manager 90, and a recovery manager 92; col. 9, lines 1 – 32]; and

reading a last buffer index value that is associated with the buffer management structure [Read values are extracted from the logged values, and writes are applied to the database using log sequence number; col. 11, lines 17 – 34].

8. Although Lomet teaches the invention substantially as claimed, Lomet does not teach a last buffer index value that identifies a last data buffer that was last used for

buffering data and selecting a data buffer that is associated with the buffer management structure based on the last buffer index value.

However, Pang teaches buffering data in a multithreaded environment [a calling thread on one of the processors 200 to request that event performance data be logged by the event tracing program 230; col. 4, line 60 – col. 5, line 26], a data management structure that is associated with a plurality of data buffers [event tracing program 230 responds by recording the event performance data in one of a set of a log buffers; col. 5, lines 1 – 26], a last buffer index value [offset variable 206] that identifies a last data buffer that was last used for buffering data [event tracing program 230 will determine the location at which to start writing the log entry by examining the current offset value represented by the offset variable 206 at step 308; col. 6, lines 26 – 40], and selecting a data buffer that is associated with the buffer management structure based on the last buffer index value [the event tracing program 230 will then increment the offset variable 206 by at least the number of bytes required for the log entry, thereby reserving a memory block 210 for storing the log entry in the log buffer 204; col. 6, lines 25 – 43].

9. It would have been obvious to a person of ordinarily skilled in the art at the time of the invention to apply the teaching of a last buffer index value that identifies a last data buffer that was last used for buffering data and selecting a data buffer that is associated with the buffer management structure based on the last buffer index value as taught by Pang to the invention of Lomet because the offset variable represents the ending location of an occupied portion of the buffer and the offset variable is used to

determine when the log buffer is full and needs to be flushed [col. 5, line 57 - col. 6, line 13 of Pang].

10. As to claim 2, Lomet as modified teaches maintaining a data structure that is associated with the plurality of data buffers [event tracing program 230 responds by recording the event performance data in one of a set of a log buffers; col. 5, lines 1 – 26 of Pang], wherein the data structure is associated with a group of flags [reference count variable 202] that provide an indication as to whether an entry in the data structure is likely to be associated with a data buffer that is available for storing the log data [reference count variable 202 represents the number of threads that are currently using the log buffer 204 to record event data; col. 5, line 57 – col. 6, line 13 of Pang]; and

prior to writing the log data, reading a flag associated with a particular data structure entry to determine whether the particular data structure entry is likely associated with a data buffer that is available for storing the log data [prevent a buffer from being flushed event performance data is being recorded in it, a reference count is incremented prior to the recording process to signify that the buffer is currently being modified; col. 2, lines 28 – 45 of Pang].

11. As to claim 3, Lomet as modified teaches receiving a connection request from a client [At step 60, the client sends a request to the server; col. 7, lines 28 – 39 of Lomet];

assigning a thread of execution to process the connection request [a calling thread on one of the processors 200 to request that event performance data be logged by the event tracing program 230; col. 4, line 60 – col. 5, line 26 of Pang]; and

wherein the step of identifying a buffer management structure further comprises the step of the thread of execution selecting the buffer management structure from a plurality of buffer management structures [event tracing program 230 selects a log buffer 204 from the set 221 of associated buffers at step 304; col. 5, lines 55 – 67 of Pang], wherein the plurality of buffer management structures are each associated with a set of data buffers that are used for buffering data to a physical memory unit [each log buffer 204 is initially referenced in a list 220 of free log buffers until it becomes associated with one of the processors 200; col. 5, lines 1 – 26 of Pang].

12. As to claim 4, Lomet as modified teaches the resource represents one or more sets of content that are associated with a network server [a resource manager 82 that maintains temporary copies of data pages and application states; col. 8, line 60 – col. 9, line 10 of Lomet]; and

the step of identifying a buffer management structure comprises the step of selecting the buffer management structure based on one or more addresses in which the one or more sets of content are stored on the network server [stable database 94 maintains stable versions of the application states (including address spaces) and data objects, and the stable log 96 maintains a sequence of logged operations; col. 9, lines 15 – 23 of Lomet].

13. As to claim 5, Lomet as modified teaches prior to receiving the request for accessing the resource, the last buffer index value identifying a prior data buffer that is associated with the buffer management structure [event tracing program 230 will determine the location at which to start writing the log entry by examining the current offset value represented by the offset variable 206 at step 308; col. 6, lines 26 – 40 of Pang]; and wherein,

the step of reading a last buffer index value further comprises the steps of, updating the last buffer index value associated with the buffer management structure [the event tracing program 230 will then increment the offset variable 206 by at least the number of bytes required for the log entry; col. 6, lines 25 – 43 of Pang]; and

after updating the last buffer index value, selecting the data buffer based on the last buffer index value [the event tracing program 230 will then increment the offset variable 206 by at least the number of bytes required for the log entry, thereby reserving a memory block 210 for storing the log entry in the log buffer 204; col. 6, lines 25 – 43 of Pang].

14. As to claim 6, Lomet as modified teaches, the step of updating the last buffer index value includes the step of incrementing the last buffer index value, wherein the step of incrementing the last buffer index value causes the last buffer index value to reference the data buffer [the event tracing program 230 will then increment the offset variable 206 by at least the number of bytes required for the log entry, thereby reserving

a memory block 210 for storing the log entry in the log buffer 204; col. 6, lines 25 – 43 of Pang].

15. As to claim 7, Lomet as modified teaches writing the log data into the data buffer [log an event to a log buffer, the data producer program 226 first passes the event performance data to the event tracing program 230 at step 302; col. 5, lines 45 – 57 of Pang].

16. As to claim 8, Lomet as modified teaches reading a flag value [reference count variable 202] that is associated with the data buffer [log an event to a log buffer; col. 5, lines 45 – 57 of Pang], wherein the flag value provides an indicator as to whether the data buffer is likely available for storing the log data [reference count variable 202 represents the number of threads that are currently using the log buffer 204 to record event data; col. 5, line 57 – col. 6, line 13 of Pang]; and

attempting to write the log data to the data buffer if the flag value indicates that the data buffer is likely available for storing the log data [prevent a buffer from being flushed event performance data is being recorded in it, a reference count is incremented prior to the recording process to signify that the buffer is currently being modified; col. 2, lines 28 – 45 of Pang].

17. As to claim 9, Lomet as modified teaches requesting a mutually exclusive lock on the data buffer and storing the log data in the data buffer only after acquiring the

mutually exclusive lock on the data buffer [the increment and decrement operations of steps 306, 310 and 314 are performed atomically... Performing these operations atomically prevents the reference count and the offset count from becoming corrupted as a result of a context switch or execution concurrency occurring during an increment or decrement; col. 6, lines 57 – 66 of Pang].

18. As to claim 10, Lomet as modified teaches maintaining the plurality of data buffers as an array of available buffers [the data producer program 226 will pass an array containing a pointer to and size of each component of the data; col. 5, lines 45 – 60 of Pang]; and

in response to detecting that a particular data buffer contains a particular limited amount of free data space [If the offset variable 206 is greater than the size of the log buffer 204, the event tracing program 230 will add the log buffer 204 to the flush list 222; col. 6, lines 1 – 15 of Pang], removing the particular data buffer from the array of available buffers [event tracing program 230 runs a maintenance thread to flush the log buffers on the flush list 222 so that the log buffers can then be returned to the free list 220; col. 6, line 65 – col. 7, line 10 of Pang].

19. As to claim 11, Lomet as modified teaches the step of removing the particular data buffer from the array of available buffers further comprises linking the particular data buffer into a list of ready-to-write data buffers [event tracing program 230 runs a

maintenance thread to flush the log buffers on the flush list 222 so that the log buffers can then be returned to the free list 220; col. 6, line 65 – col. 7, line 10 of Pang].

20. As to claim 12, Lomet as modified teaches removing the particular data buffer from the array of available buffers [event tracing program 230 removes the association between the log buffer 204 and its respective processor and places the log buffer 204 on a flush list 222; col. 5, lines 1 – 26 of Pang]; and

storing on a non-volatile storage unit information contained in the particular data buffer [non-volatile memory 78 includes a stable database 94 and a stable log 96....the stable log 96 maintains a sequence of logged operations; col. 9, lines 15 – 25 of Lomet].

21. As to claim 13, Lomet as modified teaches maintaining the plurality of data buffers as an array of available buffers [the data producer program 226 will pass an array containing a pointer to and size of each component of the data; col. 5, lines 45 – 60 of Pang]; and

wherein the step of selecting a data buffer that is associated with the buffer management structure [event tracing program 230 selects a log buffer 204 from the set 221 of associated buffers at step 304; col. 5, lines 55 – 67 of Pang] comprises the step of:

in response to determining that no data buffer is available in the array of available buffers for storing the log data [If the offset variable 206 is greater than the size of the log buffer 204, the event tracing program 230 will add the log buffer 204 to

the flush list 222; col. 6, lines 1 – 15 of Pang], requesting a free data buffer from a global list of free data buffers [event tracing program 230 runs a maintenance thread to flush the log buffers on the flush list 222 so that the log buffers can then be returned to the free list 220; col. 6, line 65 – col. 7, line 10 of Pang].

22. As to claim 14, this is rejected for the same reasons as claim 1 above. Lomet as modified teaches a reference value [offset variable 206] that identifies a particular data buffer that is likely available for buffering data [event tracing program 230 will determine the location at which to start writing the log entry by examining the current offset value represented by the offset variable 206 at step 308; col. 6, lines 26 – 40 of Pang].

23. As to claims 15 and 16, these are rejected for the same reasons as claims 2 and 8 above.

24. As to claims 17 – 29, these are product claims that correspond to method claims 1 – 13; note the rejections to claims 1 – 13 above, which also meet these product claims.

25. As to claims 30 – 32, these are product claims that correspond to method claims 14 – 16; note the rejections to claims 14 – 16 above, which also meet these product claims.

26. As to claims 33 – 35, these are system claims that correspond to method claims 14 – 16; note the rejections to claims 14 – 16 above, which also meet these product claims.

Conclusion

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Li B. Zhen whose telephone number is (703) 305-3406. The examiner can normally be reached on Mon - Fri, 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (703) 305-9678. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Li B. Zhen
Examiner
Art Unit 2126

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lbz
June 9, 2004